

WHAT IS CLAIMED IS:

1. A quadrature modulation apparatus comprising:  
local signal generating means for generating two  
local signals each having a fundamental wave of a  
predetermined frequency and having a 90° phase  
difference therebetween;  
two low-pass filters for suppressing high-  
frequency band components of the two local signals  
generated from said local signal generating means, each  
of the high-frequency band components containing the  
fundamental wave; and  
modulation means for subjecting two-channel base-  
band signals to quadrature modulation by use of the two  
local signals respectively output from said two low-  
pass filters.
2. A radio transmission apparatus comprising:  
local signal generating means for generating two  
local signals each having a fundamental wave of a  
predetermined frequency and having a 90° phase  
difference therebetween;  
two low-pass filters for suppressing high-  
frequency band components of the two local signals  
generated from said local signal generating means, each  
of the high-frequency band components containing the  
fundamental wave;  
modulation means for subjecting two-channel base-  
band signals to quadrature modulation by use of the two

local signals respectively output from said two low-pass filters; and

radio transmission means for radio-transmitting a modulation signal obtained by said modulation means.

5       3. The radio transmission apparatus according to claim 2, wherein said radio transmission means is of a modulation loop system which includes a non-linear amplifier for amplifying the modulation signal, generates a transmission signal having the same phase deviation as a modulation signal obtained after 10 amplification by the non-linear amplifier and transmits the transmission signal by radio.

15       4. The radio transmission apparatus according to claim 3, wherein said radio transmission means selectively sets a frequency band of the transmission signal to one of a plurality of predetermined frequency bands.

20       5. The radio transmission apparatus according to claim 2, wherein said radio transmission means is of an up-conversion system which includes an up-converter for generating a transmission signal whose frequency band is converted to a predetermined frequency band by synthesizing the modulation signal with a predetermined local signal and transmits the transmission signal 25 obtained by said up-converter by radio.

6. The radio transmission apparatus according to claim 5, wherein said radio transmission means

selectively sets a frequency band of the transmission signal to one of a plurality of predetermined frequency bands.

7. The radio transmission apparatus according to  
5 claim 2, wherein said radio transmission means is of a direct conversion system for radio-transmitting the modulation signal as it is as a transmission signal.

8. The radio transmission apparatus according to  
claim 7, wherein said radio transmission means  
10 selectively sets a frequency band of the transmission signal to one of a plurality of predetermined frequency bands.

9. The radio transmission apparatus according to  
claim 2, wherein said radio transmission means includes  
15 first transmission means of a modulation loop system which includes a non-linear amplifier for amplifying the modulation signal, generates a transmission signal having the same phase deviation as a modulation signal obtained after amplification by the non-linear  
20 amplifier and transmits the transmission signal by radio; second transmission means of an up-conversion system which includes an up-converter for generating a transmission signal whose frequency band is converted to a predetermined frequency band by synthesizing the  
25 modulation signal with a predetermined local signal and transmits the transmission signal obtained by said frequency converting means by radio; and selection

means for selectively operating one of said first and second transmission means.

10. The radio transmission apparatus according to claim 2, wherein said radio transmission means includes  
5 first transmission means of a modulation loop system which includes a non-linear amplifier for amplifying the modulation signal, generates a transmission signal having the same phase deviation as a modulation signal obtained after amplification by the non-linear  
10 amplifier and transmits the transmission signal by radio; second transmission means of a direct conversion system for radio-transmitting the modulation signal as it is as a transmission signal; and selection means for  
15 selectively operating one of said first and second transmission means.

11. The radio transmission apparatus according to claim 2, wherein said radio transmission means includes  
first transmission means of an up-conversion system which includes an up-converter for generating a  
20 transmission signal whose frequency band is converted to a predetermined frequency band by synthesizing the modulation signal with a predetermined local signal and transmits the transmission signal obtained by said frequency converting means by radio; second  
25 transmission means of a direct conversion system for radio-transmitting the modulation signal as it is as a transmission signal; and selection means for

selectively operating one of said first and second transmission means.

12. A quadrature modulation apparatus comprising:  
local signal generator which generates two local  
5 signals each having a fundamental wave of a  
predetermined frequency and having a 90° phase  
difference therebetween;

two low-pass filters which suppresses high-  
frequency band components of the two local signals  
10 generated from said local signal generator, each of the  
high-frequency band components containing the  
fundamental wave; and

modulator which inputs the two local signals  
respectively outputs from said two low-pass filters and  
15 which outputs two-channel quadrature modulated base-  
band signals.

13. A radio transmission apparatus comprising:  
local signal generator which generates two local  
signals each having a fundamental wave of a  
20 predetermined frequency and having a 90° phase  
difference therebetween;

two low-pass filters which suppresses high-  
frequency band components of the two local signals  
generated from said local signal generator, each of the  
25 high-frequency band components containing the  
fundamental wave;

modulator which inputs the two local signals

respectively outputs from said two low-pass filters which outputs two-channel quadrature modulated baseband signals; and

transmitter which transmits the modulated signal.

5       14. The radio transmission apparatus according to claim 13, wherein said transmitter is of a modulation loop which includes a non-linear amplifier which amplifies the modulation signal, generates a transmission signal having the same phase deviation as a modulation signal obtained after amplification by the non-linear amplifier and transmits the transmission signal.

10      15. The radio transmission apparatus according to claim 14, wherein said transmitter selectively sets a frequency band of the transmission signal to one of a plurality of predetermined frequency bands.

15      16. The radio transmission apparatus according to claim 13, wherein said transmitter is of an upconversion system which includes an up-converter which generates a transmission signal whose frequency band is converted to a predetermined frequency band by synthesizing the modulation signal with a predetermined local signal and transmits the transmission signal obtained by said up-converter.

20      25. The radio transmission apparatus according to claim 16, wherein said transmitter which selectively sets a frequency band of the transmission signal to one

of a plurality of predetermined frequency bands.

18. The radio transmission apparatus according to  
claim 13, wherein said transmitter is of a direct  
conversion system for radio-transmitting the modulation  
signal as it is as a transmission signal.

19. The radio transmission apparatus according to  
claim 18, wherein said transmitter which selectively  
sets a frequency band of the transmission signal to one  
of a plurality of predetermined frequency bands.

10        20. The radio transmission apparatus according to  
claim 13, wherein said transmitter which includes first  
transmitter of a modulation loop system which includes  
a non-linear amplifier which amplifies the modulation  
signal, generates a transmission signal having the same  
phase deviation as a modulation signal obtained after  
amplification by the non-linear amplifier and transmits  
the transmission signal; second transmitter of an up-  
conversion system which includes an up-converter which  
generates a transmission signal whose frequency band is  
15        converted to a predetermined frequency band by  
synthesizing the modulation signal with a predetermined  
local signal and transmits the transmission signal  
obtained by said frequency converter; and selector  
which selects one of said first and second transmitter.

25        21. The radio transmission apparatus according to  
claim 13, wherein said transmitter includes first  
transmitter of a modulation loop system which includes

a non-linear amplifier which amplifies the modulation signal, generates a transmission signal having the same phase deviation as a modulation signal obtained after amplification by the non-linear amplifier and transmits  
5 the transmission signal; second transmitter of a direct conversion system which transmits the modulation signal as it is as a transmission signal; and selector which selects one of said first and second transmitter.

22. The radio transmission apparatus according to  
10 claim 13, wherein said transmitter includes first transmitter of an up-conversion system which includes an up-converter which generates a transmission signal whose frequency band is converted to a predetermined frequency band by synthesizing the modulation signal with a predetermined local signal and transmits the  
15 transmission signal obtained by said frequency converter; second transmitter of a direct conversion system which transmits the modulation signal as it is as a transmission signal; and selector which selects  
20 one of said first and second transmitter.

23. A quadrature modulation method comprising the steps of:

generating two local signals each having a fundamental wave of a predetermined frequency and  
25 having a 90° phase difference therebetween;

suppressing high-frequency band components of the two local signals, each of the high-frequency band

components containing the fundamental wave; and  
subjecting two-channel base-band signals to  
quadrature modulation by use of with the two local  
signals whose high-frequency band components are  
5 suppressed.

24. A quadrature modulation method comprising the  
steps of:

generating two local signals each having a  
fundamental wave of a predetermined frequency and  
10 having a  $90^\circ$  phase difference therebetween;

suppressing high-frequency band components of the  
two local signals, each of the high-frequency band  
components containing the fundamental wave; and

15 quadrature modulating two-channel base-band  
signals with the two local signals whose high-frequency  
band components are suppressed.